

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A hollow structure plate formed by fusing a plurality of hollow protrusions that are projected in each of two thermoplastic resin sheets with end faces of the hollow protrusions facing against one another,

wherein said hollow protrusions are truncated cone-shaped,

wherein a ratio between a total area of lower base portions of said hollow protrusions and an area of liner portions of the thermoplastic resin sheets is ~~greater than or equal to 0.3 and less than 0.6~~ in a range from 0.3 to 0.58,

wherein the lower base portions of said hollow protrusions are open portions of said hollow protrusions which are opposite to the end faces of the hollow protrusions, and the liner portions of the thermoplastic resin sheets are portions of the thermoplastic resin sheets in which the hollow protrusions are not formed, and

wherein a rising angle of a side face of each of said hollow protrusions in a vertical plane including a central axis of the hollow protrusion is in a range from 50 degrees to 70 degrees.

2-4. (Canceled)

5. (Currently Amended) A method for manufacturing a hollow structure plate comprising:

introducing, using a pair of sheet-introduction plates, two thermoplastic resin sheets into a pressure-reduced chamber;

attracting and attaching the thermoplastic resin sheets respectively to a circumferential

surface of each of a pair of upper and lower emboss rollers that are arranged rotatably in said pressure-reduced chamber to form a multitude of hollow protrusions on each of the thermoplastic resin sheets in accordance with a shape of a plurality of pins projected from each of the emboss rollers; and

thermally fusing, using a heater that is disposed between the pair of sheet-introduction plates, the end faces of said hollow protrusions in a position of a contact point of the emboss rollers continuously;

wherein the pair of sheet-introduction plates are inclined in a direction toward the contact point; and

wherein the emboss rollers satisfy the following conditions:

each of said pins is truncated cone-shaped;

a ratio between a total area of lower base portions of the pins and a surface area of said emboss rollers on which the pins are not formed, is ~~greater than or equal to 0.3 and less than 0.6~~
in a range from 0.3 to 0.58; and

a rising angle of a side face of each of the pins in a vertical plane including a central axis of the pin is in a range from 50 degrees to 70 degrees.

6. (Canceled)

7. (Currently Amended) An apparatus for manufacturing a hollow structure plate comprising:

a pressure-reduced chamber that is evacuated to reduce a pressure inside;

a pair of upper and lower emboss rollers that are supported with bearings rotatably in said pressure-reduced chamber in a state in which circumferential surfaces of the emboss rollers face a front opening portion of said pressure-reduced chamber, wherein a plurality of pins provided on one of the emboss rollers is brought into contact with a plurality of pins provided on the other of the rollers via two thermoplastic resin sheets in a position of a contact point;

a pair of sheet-introduction plates for introducing the two thermoplastic resin sheets into the pressure-reduced chamber, the pair of sheet-introduction plates being inclined in a direction toward the contact point; and

a heater for heating that is arranged at said front opening portion of said pressure-reduced chamber between the pair of sheet-introduction plates;

wherein each of said pins of said emboss rollers is truncated cone-shaped;

wherein a ratio between a total area of lower base portions of the pins and a surface area of said emboss rollers on which the pins are not formed, is ~~greater than or equal to 0.3 and less than 0.6~~ in a range from 0.3 to 0.58; and

wherein a rising angle of a side face of each of the pins in a vertical plane including a central axis of the pin is in a range from 50 degrees to 70 degrees.